

## **DEREGULATION OF THE PETROLEUM DOWNSTREAM SECTOR AND NIGERIAN ECONOMY: AN ECONOMETRIC INVESTIGATION**

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### **ABSTRACT:**

*Nigeria is abundantly endowed with petroleum resources and over the years has generated huge revenue from it. However, the domestic pricing of petroleum products has been a subject of controversy. While some believe that government should continue to regulate and subsidize the products, others opine that total deregulation of the petroleum downstream sector should be enforced to stimulate competition in the sector. Considering that the Government has in one time or the other partially deregulated the price of petroleum products, and recently, totally deregulated the market, this study examines the impact of deregulation of petroleum product prices on the economic growth of Nigeria from 1980 to 2015. The sources of data for the study include the World Bank Economic Indicators, the Nigerian National Petroleum Corporation and the OPEC Statistical Bulletin. The study employed the Augmented Dickey-Fuller unit root test to test for the stationarity of data, while the long-run equilibrium relationship of the variables was tested with the Johansen Cointegration test. Moreover, to determine the relationship between the deregulated petroleum product prices and economic growth of Nigeria, the Least Square technique was used, whereas the Granger Causality test was employed to determine the direction of causality between variables. The findings revealed that the deregulation of the petroleum downstream sector is strongly related to economic growth of Nigeria, nevertheless none of the prices of the petroleum products have significant impact on the economy of Nigeria. This study therefore recommends that existing refineries should be made to function optimally and new ones built to help stabilize the domestic price of petroleum product. To achieve this, there is need for private participation and investment considering the fact that government cannot do it alone.*

**Keywords:** Gross Domestic Product per Capita, Premium Motor Spirit, Dual Purpose Kerosene and Automated Gas Oil

### **1.0 Introduction:**

Oil and gas industry has continued to be the mainstay of the Nigerian economy since 1956 when oil was discovered at Oloibiri in the Niger Delta region. It constitutes over 85% of total export earnings in Nigeria.

According to CBN report of 2011, the ratio of oil revenue to total government revenue in 1990 was 73%, it grew to 84% and 89% in 1993 and 2006 respectively. In 2010, it was 74% and 64% in 2014. The industry, no doubt, is widely acknowledged at the nation's live-wire because it creates employment opportunities for Nigerians, contributes to Nigeria's gross domestic product as well as government revenue, boosts foreign exchange reserves, provides cheap and readily available sources of energy for industry and commerce through the operations of the local refinery and the utilization of locally discovered natural gas (Odularu, 2008). However, Nigeria being the largest crude oil producer in Africa and seventh in the world still import and pay international prices for the natural resources it have in abundance. Nigeria currently relies heavily on the importation of refined petroleum products despite being a major crude oil exporter. This is due to the inefficiencies in the downstream petroleum sector, as reflected in breakdown and low capacity utilization experienced by the nation's four refineries, price distortions and the accompanying limited incentives to invest in refineries, uncompetitive market structure, high distribution costs and rent-seeking behaviour and the associated smuggling and other forms of leakages. (Ayodele, Obafemi, and Ebong, 2013). Considering the huge amounts spent overtime in subsidizing the consumption of petroleum products in Nigeria, the government decided to fully deregulate the retail price of petroleum. The deregulation is aimed at reducing the government role as owner of assets and operator in the sector while maintaining active role as a policy maker and regulator. The policy initiative is predicated upon government objective of removing the institutional, regulatory and financial difficulties inhibiting the sector's growth and development. Kupolokun (2005) noted that the main goals of deregulation initiatives include dismantle the natural monopoly of the state owned enterprise by privatizing and deregulating price controls, create competition in the downstream sector by encouraging more companies to get involved and eventually supplying the market at competitive pricing levels, reduce the cost government incurs on subsidizing the sector which runs as high as \$1.5 billion annually, and can consequently use the resources freed up to handle the socio-economic and welfare needs of the Nigerian people, boost Foreign Direct Investment(FDI) to the Nigerian economy, reduce transportation costs of petroleum products and people, In a nutshell, deregulation is to promote competition in areas previously considered to be natural monopoly of an individual, group of people or government enterprises.

In recent years, deregulation of the downstream sector of the oil and gas industry has become a controversial issue in Nigeria. The government believes that subsidy for fuels distort the system, and encourages corruption; that deregulation will offer more benefits to Nigerians because the oil market will become more competitive and efficient, and the resulting benefits will be passed on to Nigerians in the form of lower product prices, better quality of service and ease as well as constant availability of the product (Yar'adua, 2009). Odidison (2003) stated that deregulation would bring sanity into the oil and gas industry since smuggling of petroleum products, vandalization of pipelines and all other vices in the sector will be totally removed. According to him, domestic price of oil will increase and the smugglers being irrational are likely to reduce their activities. Consequent upon this, the neighbouring countries that rely on smuggled petroleum products would experience scarcity and as such would be forced to take the legal and normal route to buy fuel. Akinmade(2003) explained that the emergence of the private refineries will create a better maintenance culture of the refinery and this will likely reduce unemployment by employing both skilled and unskilled labour. They would also engage in the training of manpower in Nigeria and thereby contribute to human development in the country.

In the other hand, some scholars and pressure groups in the country strongly believed that deregulation of the downstream oil sector will have negative effects on the Nigeria economy. Eson (2002) sees deregulation in Nigeria as a measure that might give marketers of petroleum products the opportunity to fix prices, which in most cases lead to exploitation of the average Nigerian. Ogunbodede, Ilesanmi and Olurankinse (2010) explained that deregulation which results in increase in fuel price have a multiplier effects on the economy; that is, the ensuing inflation would rubbish the income of the worker in such a way that greater percentage of their income would be spent on consumption. The Nigeria Labour Congress (NLC) are of the opinion that deregulation is not a panacea and may not be an appropriate response to the poor performance of the

downstream oil sector, they argued that deregulation has wide reaching implications for industry and individual households in the country. It will leads to increase in cost of production at the industry level and may result in cut down of production which in turn could lead to loss of jobs. This has generated a lot of industrial and social upheavals in the country in the form of protests and riots.

Recently, the central government took the hard decision by fully deregulating the downstream oil market, In view of the above therefore, this study is structured to investigate the effect of this deregulation on the growth of the Nigerian economy.

## 2.0 Literature Review:

### 2.1 Theoretical Framework:

#### 2.1.1 The General Equilibrium Theory:

The theories of deregulation is largely taken from the general equilibrium theory which postulates the relevance of society's limited resources for efficient production of the needs of the society and efficient distribution of commodities and services among various consumers. Acemoglu(2010) refers general equilibrium as factors that become important when consider counter changes are contemplated. This may induce changes in factor price and technology, which are held constant in partial equilibrium condition. In a perfectly competitive market, what determines the amount of output a firm will be willing to supply is a function of so many factors such as the type of market they operate in, the type of products produced, the ratio of marginal cost to marginal revenue, which comes into play because all profit maximizing firms would like to choose the output that will equate marginal cost with marginal revenue (Lipsey and Chrystal, 2004).

The downstream petroleum sector in Nigeria is made up of major oil marketers and independent marketers who supply homogenous products, but have the power to increase prices by creating artificial scarcity (Maduka, Ihonre and Anochiwa, 2015). The goal of deregulation of the downstream oil sector is to ensure constant supply of products, reduce prices through the forces of demand and supply and to ensure efficiency through competition among firms. But the competitiveness of a market is determined by the power of individual firms to influence the price of products in that market (Lipsey and Chrystal, 2004). This implies that if a single firm does not have power to influence the market in which it sells its goods, the market will be more competitive.

#### 2.1.2 Deregulation of Oil Market and Economic Growth:

The effect of changes in the price of oil on economic growth can be understood via its demand or supply side effect. The demand side effect is the situation where the prices of petroleum products increases as a result of increased economic activity which results in high demand of oil and this is consistent with the theory that the higher the demand other things being equal, the higher will be the prices. Under this circumstance the effect on GDP will be positive. On the other hand if the increase in oil prices is due to supply side effect which means the increase in the oil prices is due to reasons other than increase in demand then the effect on GDP could be negative, which indicates that rising oil prices are a pointer to the reduced availability of essential input to production, leading to a reduction in prospective output (Brown and Yucel 2002, Abel and Bernanke 2001). Therefore, there is an upsurge in production cost and the growth of industrial output and productivity are slowed, which could have negative effect on GDP and Employment.

#### 2.1.3 Method of Pricing Petroleum Products:

**The Wealth Maximizing Model:** This model was developed by Hotelling (1931). It was initially developed to deal with the economics of exhaustible resources. It posits that the aim of price and output decisions was

the maximization of present value of oil assets. This explanation appeared in Nigeria in the 1970s, but short-lived and gone into extinction later in 1979/80.

**The Property Rights Model:** This model was proposed by Johnny-Mead. The model saw price increase of the early 1970s in terms of the transfer of oil fields from major oil companies to producer states, which have a lower time discount rate than the oil companies. Lower time discount rates, limited absorptive capacity and increasing risk of investments in western countries accounted for the limited supply of oil on the world-market by the producing countries. This leads to higher oil prices.

**The Target Revenue Model:** This model was developed by Teece (1982). It argues that OPEC member States produce oil to meet their budget needs. However, the weakness of the model is that member countries do not have uniform absorptive capacities as there are low absorbers (Southern Arabia, Kuwait and Libya), moderate absorbers (Iran, Iraq, Venezuela and Algeria) and high absorbers (Nigeria and Indonesia).

**The Market Follower Model:** This model emphasizes that OPEC pricing decisions are largely dependent on the spot market prices. However, the direction of causality between the two is essentially an empirical matter.

## **2.2 Conceptual Framework:**

Downstream oil deregulation refers to the removal of protection with regard to importation, processing and retailing of petroleum products as well as the determination of prices of petroleum products. According to Kupolokun (2005), deregulation is the process of transforming an economy to one that is open to all interested players and is usually driven by the market forces.

Ernest and Young, (1988) posit that deregulation and privatization are elements of economic reform programmes charged with the ultimate goal of improving the overall economy through properly spelt out ways. For example, freeing government from the bondage of continuous financing of extensive projects which are best suited for private investment by the sale of public enterprises; encouraging efficiency and effectiveness in resources utilization; reducing government borrowing while raising revenue; promoting healthy market competition in a free market environment; improving returns from investment and broadening enterprises share ownership thus engendering capital market development (Izibili and Aiya, 2007).

Deregulation is the gradual withdrawal or removal of regulation in the way of liberating the economy. The concept is also referred to as the system of removing impediments to trade; control of the movement of goods and services, thereby allowing free flow interplay of the forces of demand and supply in the determination of the price of commodities and wages of services rendered (Ojo, and Adebunsi, 1996).

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Deregulation therefore occurs when the government seeks to allow more competition in an industry that condones near monopolies hence, a general word that refers to the practice of transforming an economy to one that is open to all interested players and is usually driven by market forces. Akinwumi et al (2005), sees deregulation as the removal of government interference in the running of a system. This means that government rules and regulations governing the operations of the system are relaxed or held constant in order for the system to decide its own optimum level through the forces of supply and demand (Ekundayo, and Ajayi, 2008),.

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### *2.3 Empirical Review:*

Ezie and Beida (2014) examined deregulation of downstream oil sector and optimal petroleum pricing in Nigeria. Log linear error correction model was adopted to examine how Custom and excise duties (CED), petroleum profit tax (PPT), and crude oil production (COP) had impacted on petroleum pricing (PR) in Nigeria. Unit root test was carried out on each of the variables to determine their level of stationarity. Three of the variables were however found stationary after first difference and one after second difference, and then it was safe to proceed with Johansen Cointegration Test. The integrated variables were then used for the regression analysis. The cointegration result showed that the variables used in the model have a long term, or equilibrium relationship between them. The result showed that with deregulation of the downstream oil sector, the amount of levies on importation of petroleum would hike the price of domestic sales of petroleum. This shows that, deregulation would discourage the importation of refined fuel and as such it would encourage foreign direct investment in the oil and gas sector. More so, the result showed that the quantity of crude oil production in Nigeria has been far below the optimal capacity and has contributed positively to petroleum pricing increase over the years in Nigeria.

Bello and Cavero (2008) conducted a study on the Spanish retail petroleum market which is the downstream sector of the Spain oil industry, and focus on the pattern of liberalization and competition since the deregulation of the market in 1992. According to them the Spain oil industry has been under strict government control from 1927 to 1984, the country's national oil company CAMPSA "Compania Arrendataria Del Monopolio de Petroleos S.A." held the concessionary right and conducts the exploration, production, refining and final distribution of petroleum products in the country. The period was characterized by low quality service, managerial, technical, scale and allocation inefficiencies this culminated into the decision to liberalize. However it was discovered that from the year 1992 when the liberalization policy brought about competition in the downstream sector there was significant rise in the number of service stations in the country from 4800 in 1992 to 8600 in 2005, furthermore this brought about structural changes in refining the products in the country. The main finding of the study was that in only a few years the Spanish oil industry has moved from being a state monopoly condition to the condition of free market competition, which brought about retail market growth, development and modernization. It also gives the national oil company a good platform to compete with the new comers in the industry. Another important finding was that different prices were charged for different quality of products, and deregulation of refineries and retail outlets eases price competition in the final market.

Richard (2012) asserts that Deregulation of the downstream oil sector remains the path forward in expanding opportunities for economic growth and a competitive downstream sector. If regulation is limited to oversight and supervisory functions, aimed at guaranteeing quality of products and preventing consumer exploitation, then the process of deregulation could help achieve greater cost-effectiveness.

Richard (2012) further asserted that research and analysis show that even if all the country's refineries were to operate at full capacity, there would still be a petrol supply gap of 15 million litres per day. Therefore,

importation will remain inevitable until additional refining capacities are built through the on-going Greenfield Refinery Project.

In a nutshell, deregulation of downstream petroleum industry means official withdrawing from fixing of petroleum product prices and services. It does not entails that the government would continue to be involved in the area of national policy articulation and the policy in the industry, to ensure security of life and property and the environment as well as ensuring equity and fair dealing among all the stakeholders in the industry. Hence deregulation is a market place where:

1. Crude oil is sold to all refiners at international prices.
2. All willing and able operators are free to import fuel that meets quality specification.
3. There is unrestricted entry into the industry and unsubsidized exit.
4. The petroleum product marketing company (PPMC) is transformed into common carrier.
5. The department of petroleum resources (DPR) is compared to regulate standards quality safety and licensing in industry.

The proponents of deregulation of the downstream oil sector of the Nigerian economy posit that the liberalization and deregulation of the downstream oil sector would finally actualize the objective of ending perennial fuel scarcity and maintaining sustainable fuel supply across the economy.

Barkido (2010) stresses that the benefits of deregulation are enormous as it is meant to eradicate huge revenue spent as subsidy and that between 2006 and 2009, about N25 trillion was spent which is why its removal have become so imperative.

Bagheboand Niyekpemi (2015) investigates the performance of the downstream petroleum sector over the years and its impact on economic growth in Nigeria. The time horizon covered 1980-2012 this is because, data for previous years were not sufficiently available. The study used a simple regression model with ordinary least square (OLS) techniques of data analysis. The result shows that OR, NOR, FDI and CONSUMPT are positive and statistically significant on RGDP. Also F-statistic shows that changes in the independent variables are statistically significant and that deregulation of the downstream sector cannot be avoided. Therefore Government should deregulate

Anyadike (2013) examines the implication of the downstream oil sector on the Nigerian economy. It discusses the implication of deregulation of the downstream oil sector of Nigerian on her economy by highlighting the main thesis of the proponents and that of the opponents of deregulation and fuel subsidy removal. A likert-type scale was used in designing the questionnaire for data collection administered to the three core Niger-Delta states (Delta, Rivers and Bayelsa) where 1177 respondents were randomly selected for opinion sampling. Descriptive and chi-square was used and result revealed that deregulation of the downstream oil sector is a good policy that was wrongly implemented hence the existing four refineries are left in their comatose state with promises of a total turn around maintenance.

### **3.0 Material and Methods:**

#### ***3.1 Sources of Data:***

The time series data collected from secondary sources covers a period of thirty six years spanning from 1980-2015. This period witnessed several price deregulation; from 1979, 1986, 1994, 2008, 2011 and 2016. The data used were sourced from World Bank economic indicators, OPEC and NNPC Statistical Bulletin. The gross domestic product growth rate is the proxy for economic growth, while the explanatory variables are premium motor spirit, automotive gas oil and dual purpose kerosene.

**3.2 Estimation Techniques:**

The multivariate regression analysis is employed to estimate the relationship between petroleum price deregulation and economic growth of Nigeria. The Phillips-Perron unit root test and the Johansen Cointegration test were used to ensure that the results are not spurious.

**3.3 Model Specification:**

The functional model for the explained and explanatory variables is stated in equation 3.1 below:

$$GDPPC_t = f(PMS_t, AGO_t, DPK_t, e_t) \tag{3.1}$$

The econometric representation of the model in logarithm form is presented in equation 3.2 below:

$$\Delta \log GDPPC_t = \beta_0 + \beta_1 \Delta \log PMS_t + \beta_2 \log \Delta AGO_t + \beta_3 \log \Delta DPK_t + e_t \tag{3.2}$$

Where GDPPC is the gross domestic product per capita (proxy for economic growth),

PMS is premium motor spirit

AGO is automotive gas oil

DPK is dual purpose kerosene

$\beta_1$ – $\beta_3$  are the coefficient of the explanatory variables

$\beta_0$  is the constant value

e is the error term

log is natural logarithm

$\Delta$  is change in petroleum prices over the years

The a priori sign is parametrically represented as  $\beta_1 = \beta_2 > 0, \beta_3 < 0$ .

**4.0 Results of Data Analysis:**

**4.1 Results of Unit Root Test:**

Time series data may lead to spurious regression if they are not stationary. To avoid this, unit root test was carried out to ensure that all the variables is stationary. The technique of Phillips-Perron unit root test was employed to test for the stationarity of each of the variables. The summary of the results are shown in Table 4.1 below.

**Table 4.1: Summary of Unit Root Test Result**

Variables	Stages	Phillips-Perron Statistic	1% Critical Value	Order of Integration	Decision
GDPPC	At Levels	0.034096	-3.632900		NonStationary
	1 <sup>st</sup> Diff	-4.983003**	-3.639407	I(1)	Stationary
PMS	At Levels	1.049189	-3.632900		NonStationary
	1 <sup>st</sup> Diff	-5.662291**	-3.639407	I(1)	Stationary
DPK	At Levels	0.836337	-3.632900		NonStationary
	1 <sup>st</sup> Diff	-6.132053**	-3.639407	I(1)	Stationary
AGO	At Levels	-0.175763	-3.632900		NonStationary
	1 <sup>st</sup> Diff	-5.931224**	-3.639407	I(1)	Stationary

Source: Researchers Computations Summarized from Eview 7.1 Output where \*\* denotes stationarity at first order of integration

The results of the Phillips-Perron unit root test summarized in Tables 4.1 above revealed that none of the variables are stationary at levels. On further analysis, all the variables became stationary at first order of integration, I(1).

**4.2 Cointegration Test:**

Given that all our variables suffer from the problem of stationarity which means they are integrated at first order, I(1), there is need to test for a long term relationship by means of Johansen cointegration technique. Two or more variables will be cointegrated if they have a long term equilibrium relationship between them. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship among the variables (Brooks 2011). To reject the null hypothesis of no cointegration, the Trace statistics and Maximum Eigen Value statistics must be greater than the Critical Value. Table 4.2 below presents the results of cointegration test:

**Table 4.2: Results of Cointegration Test**

Hypothesis	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
$r=0$	0.598850	60.48740	47.85613	0.0021
$r\leq 1$	0.406050	29.43116	29.79707	0.0551
$r\leq 2$	0.282899	11.71849	15.49471	0.1709
$r\leq 3$	0.012049	0.412159	3.841466	0.5209
		<b>Maximum Eigen Statistic</b>		
$r=0$	0.598850	31.05624	27.58434	0.0172
$r\leq 1$	0.406050	17.71267	21.13162	0.1410
$r\leq 2$	0.282899	11.30633	14.26460	0.1395
$r\leq 3$	0.012049	0.412159	3.841466	0.5209

*Source: Researchers Computations Summarized from Eview 7.1 Output*

A look at Table 4.2 revealed that both trace and maximum Eigen value show that there is one cointegrating equation among the variables. We can observe from the Table 4.2 above that the Trace statistic of 60.49 is greater than the Critical Value of 47.86. Thus we reject the null hypothesis that  $r=0$ . Similarly, the Maximum Eigen Value statistic of 31.06 is greater than the critical value of 27.58 and hence we reject the null hypothesis of no cointegration and confirm that there is at least one cointegration equation among the variables, hence we conclude that there is long term relationship between the variables under study.

**4.3 Granger Causality Test:**

In order to determine whether changes in one variable granger cause changes in another, we employed the Granger (1969) causality technique. Granger causality method of investigating whether A causes B is to see how much of current B can be explained by past values of B and then to see whether by including lagged values of A we can improve the explanation of B. B is said to be Granger-caused by variable A if A helps in the prediction of B. The main idea of causality is quite simple, if A causes B, then changes in A should precede changes in B (Pindyck and Rubinfeld, 1998). This characteristic makes causality test an important one in the test of endogeneity. Table 4.3 below summarized the result of the Causality test.



**Table 4.3: Result of Granger Causality Test**

Null Hypothesis:	Obs	F-Statistic	Prob.
PMS does not Granger Cause GDPPC	34	5.89919	0.0071
GDPPC does not Granger Cause PMS		6.85951	0.0036
AGO does not Granger Cause GDPPC	34	2.02865	0.1498
GDPPC does not Granger Cause AGO		2.37004	0.1113
DPK does not Granger Cause GDPPC	34	4.03424	0.0285
GDPPC does not Granger Cause DPK		2.20456	0.1284

Source: Eview 7.1 Statistical Analysis

Table 4.3 presents the results of pair wise Granger causality among the gross domestic product per capita, premium motor spirit, automotive gas oil and dual purpose kerosene. The results indicate that a bi-directional causal relationship is found between premium motor spirit and gross domestic product per capita, while a one-way relationship exist from dual purpose kerosene to gross domestic product per capita. These imply that deregulating prices of petroleum products in Nigeria caused a boost in the economic growth as the huge sum which were formerly paid to import premium motor spirit and dual purpose are now channeled into the economic, social and other growth-driven sectors of the economy.

#### 4.4 Least Square Regression Results:

Table 4.4 below presents the results of the regression between the dependent variable (gross domestic product per capita) and explanatory variables (premium motor spirit, automotive gas oil and dual purpose kerosene) for the period of 36years (1980-2015).

**Table 4.4: Results of Least Square Regression**  
Dependent Variable - GDPPC

Variables	Coefficient	Standard Error	t-Statistic	Prob. Value
Constant	197223.1	6689.653	29.48181	0.0000
PMS	418.3857	647.1710	0.646484	0.5226
AGO	428.5844	232.5152	1.843253	0.0746
DPK	1167.969	1096.171	1.065498	0.2946
R-square	0.836788	Akaike info criterion		23.50113
Adj R-Square	0.821487	Schwarz critierion		23.67707
S.E. of regression	29126.53	Mean dependent var		247785.4
Sum of squared resid	2.71E+10	S.D. dependent var		68937.30
Log likelihood	-419.0203	Hannan-Quinn criter		23.56254
Durbin-Watson	1.396573	F-Statistic		54.68820 (0.000000)

Source: Author's computation from Eview 7.1

The regression results in Table 4.4 above shows that the constant value of 197223.1 in the model, implying that gross domestic product per capita will be to 197223.1 when the explanatory variables as used in this study are held constant. In addition, the three explanatory variables have positive coefficients indicating a direct relationship. Further analysis revealed that at 5% critical value, none of the deregulated petroleum product prices is significantly related to economic growth of Nigeria. Specifically, a unit increase in premium motor spirit; automotive gas oil and dual purpose kerosene will increase the Nigerian economy by 418.39units, 428.58units and 1167.97units respectively.

The value of R-square adjusted of 0.8215 represents that 82.15% of changes in gross domestic product per capita are explained by the joint variation of the prices of petroleum products, while the remaining 17.85% is accounted for by factors not specified in the model. In addition, the F-statistic of 54.69 with probability value of 0.000000 is a strong indication that the model is statistically significant and confirms that deregulated petroleum product prices is connected to economic growth in Nigeria.

### **Implications of Findings:**

The central objective of this study which is the effect of petroleum product price deregulation on economic growth of Nigeria was fully realized as the findings indicated that the deregulation policy have a significant effect on economic growth of Nigeria. This is in line with the works of Maduaka, Ihonre and Anochiwa (2015) and Sani and Kouhy (2014) who in their separate studies revealed that the deregulation of the downstream sector of the petroleum sector led to the growth of the Nigerian economy.

Explicitly, the liberalization of the price of premium motor spirit has a positive implication on economic growth of Nigeria. However, the relationship does not have significant effect in the economy. This may not be unconnected with the alleged corruption (e.g. oil subsidy scam) in the oil downstream sector that has seen the diversion of funds raised from increasing the price of the product into private pockets by major players in the oil sector. These funds if invested properly in the economy will significantly create opportunities that will provide employment, develop social and economic infrastructures that will increase the human development index of the citizenry. In addition, the deregulation of the premium motor spirit also led to increase in general price level, which erodes values in the economy.

The coefficient of automated gas oil is positively but not significantly related to economic growth of Nigeria. Nigeria is a country where the power sector remains grossly undeveloped. As a result, several industrialist and manufacturers power their facilities with power generating sets which are powered with automated gas oil. Deregulation of the prices of the products in part account for the increase in prices of the products manufactured domestically and cost of transportation, which have an inflationary impact on the economy.

Lastly, the deregulation of the price of dual purpose kerosene has a positive coefficient. However, it is insignificantly related to the growth of the Nigerian economy. A greater percentage of Nigerian depends on dual purpose kerosene for domestic consumption. Increasing the price may have led people to seek alternative source of energy for domestic consumption e.g. felling of economic trees and deforestation which can lead to desertification.

### **5.1 Conclusion:**

The deregulation of the petroleum product prices is a welcomed development that has a lot of positive implication in an economy. Nigeria has witnessed several partial deregulations at different times till recently that it has fully deregulated the sector. This policy makes available large chunk of funds that were originally used in subsidizing the product for developmental projects. However, the investments of these funds have not been handled properly given that the translation in the economy has been minimally felt. It goes down to portray that deregulation is not an end, but its transparency and accountability of accrued funds is, otherwise, it will end up creating more hardship in the form of inflation than gain if not managed effectively.

### Recommendations:

Based on these findings, the following recommendations are policy imperatives if Nigeria must benefit from deregulation policy of the oil sector:

- i. To effectively reap the dividends of petroleum price deregulation, it is necessary that the existing refineries should be functioning effectively and new ones built that will help to stabilize the domestic price of petroleum product.
- ii. Public financial managers should be more transparent in managing the proceeds generated from the oil sector to stimulate the required economic growth and development.
- iii. Government should encourage more private sector participation so that better equipped oil infrastructures (refineries and pipelines) can be built and the cost of refining crude oil and its distribution will reduce.

### References:

- Abel, A.B. and Bernanke, B.S. (2001). Macroeconomics. Boston: Addison Wesley Longman Inc.
- Acemoglu, D. (2010), "Theory, Equilibrium and Political Economy in Development Economics", *Journal of Economic Perspective*, 24(3), pp.17-32.
- Akinmade, T.N. (2003), "Privatization: Bridging Hope Back", *The Nigerian Tell Magazine*, Vol. 2, p.48.
- Akinwumi, F.S, Isuku, E.j. and Agwaranze, D.Q. (2005), "University Education Deregulation: Pros and Cons" in G.O. Akpa, S.U. Udoh and E.O. Fagbamije (Eds) *Deregulating the Provision and Management of Education in Nigeria*, Jos: NAEAP Publication. pp. 151-158.
- Anyadike, N.O. (2013), "Assessment of the Implication of Full Scale Deregulation of the Downstream Oil Sector on the Nigerian Economy: The Neoliberalism Approach", *Global Journal of Political Science and Administration Vol.1, No.2, pp.23-48*.  
[www.ea-journals.org](http://www.ea-journals.org).
- Baghebo, M. and Niyekpemi, O.B. (2015), "Dynamics of the Downstream Petroleum Sector and Economic Growth in Nigeria", *International Journal of Social Science Studies, Vol. 3, No. 4; pp. 134-144*. <http://ijsss.redfame.com>.
- Barkido (2010). Assessment of the Implication of Full Scale Deregulation of the Downstream Oil Sector on the Nigerian Economy, *Global, Journal of Political Science and Administration*, 1(2), 23-48.
- Bello, A. and Cavero, S. (2008), "The Spanish Retail Petroleum Market: New Patterns of Competition since the Liberalization of the Industry Energy Policy, 36, 2, 612-626, Elsevier.
- Brown, S.P.A. and Yucel, M.K. (1999), "Oil Price and US Aggregate Economic Activity", *Federal Reserve Bank of Dallas Economic Review*. 14 pp.16-53.

- Eson, P. (2002), "Political Economy of Oil Extraction in Nigeria. In Boiling Point – A Committee for the Development of Human Rights (CDHR) Publication on the Crisis in the Oil Producing Communities in Nigeria, Raji, W., A. Ale and E. Akinsola (Eds.), Frankad Publishers, Lagos, Nigeria.
- Ezie, O. and Beida, O.J. (2014), "Nigeria's Downstream Oil Sector Deregulation and Efficient Petroleum Pricing: An Error Correction Model (Ecm) Approach", *International Journal of Economics, Commerce and Management*, Vol. II, Issue 7, pp.1-15. <http://ijecm.co.uk/>.
- Granger, C.W.J. (1969), "Investigation of Causal Relation by Econometrics and Cross-Sectional Method", *Econometrica*, 37(1), pp.424-438.
- Hotelling, H. (1931), "The Economics of Exhaustible Resources", *Journal of Political Economy* 39 (2) April.
- Kupolokun, F. (2005), "Liberalization: The Experience of the Nigerian Petroleum Sector", *Alexanders Gas and Oil Connections*, Vol. 2.
- Lipsey, R.G. and Chrystal, K.A. (2004), "Economics" 10<sup>th</sup> Edition, New York: Oxford University Press.
- Maduka, A., Ihonre, H. and Anochiwa, A. (2015), "Impact of Deregulation of the Downstream Oil Sector on Economic Growth in Nigeria", *EPR International Journal of Economic and Business Review*, Vol. 3, Issue 4, pp.19-30
- Odidison, O. (2003). Fuel Price Hike: OPS Union React", *The Nigerian Business Times*, 17.
- Odularu, G. O. (2008), "Crude Oil and Nigerian Economic Performance", *Oil and Gas Business. (Online)*. Available: <http://www.ogbus.ru/eng/>
- Ogunbodede, E., Ilesanmi, A. and Olurankinse, F. (2010), "Petroleum Motor Spirit (PMS) Pricing Crisis and the Nigerian Public Passenger Transportation System", *Journal of Social Sciences*, Vol. 5, pp. 113 – 121.
- Ojo, M.O. and Adebusuyi, B.S. (1996). "The State of the Nigerian Petroleum Industry: Performance, Problems and Outstanding Issues", *CBN Economic and Financial Review Vol.34, September*.
- Richard A (2012). FAQ on Deregulation of the Downstream Petroleum Sector and Removal of Fuel Subsidy. [bizhallmark.com/index.php/feed/permalink/6557.txt](http://bizhallmark.com/index.php/feed/permalink/6557.txt).
- Sani, S.B. and Kouhy, R. (2014), "Effect of the Deregulation of Downstream Oil Sector on the Gross Domestic Product (GDP) and Employment in Nigeria", *The Macrotheme Review* 3(3), pp.117-136